

Unprotected condition of a new breeding Mandarin Duck (*Aix galericulata*) population in Pingshan, Hebei Province, China

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Abstract: A new breeding population of Mandarin Duck (*Aix galericulata*, Linnaeus) was first recorded in 2003 in Jiaotanzhuang-Hehekou region of Pingshan county, Hebei Province, China. Recently, the gradually increasing population indicates that there are suitable breeding habitats (such as foraging habitats and nesting sites) for Mandarin Duck. However, these habitats are always close to human disturbances, which are the potential risk for their population. Therefore, it is urgent to put forward an applicable protection strategy, in order to strengthen the public awareness for this unprotected population.

Keywords: breeding; Mandarin Duck; Pingshan; unprotected population

Introduction

Mandarin Duck (*Aix galericulata*, Linnaeus) belongs to Family Anatidae, Order Anseriformes. The species once was widespread in eastern Asia, while their population has been reduced due to the large-scale forest destruction (Madge and Burn 1987). In China, Mandarin Duck is currently classified as the second class of national protected wild animal, and listed as the vulnerable species to extinction in *China Red Data Book of Endangered Animals* (Wang 1998). The breeding grounds of the species are mainly located in mountainous regions and water areas of Northeastern Inner Mongolia, and Wusulijiang River, Heilongjiang River, Tumenjiang River, Songhuajiang River, and Yalujiang River of Northeast China. Their wintering grounds are mainly located in Fujian, Guangdong and other southeast provinces of China. In spring, the wintering population of the bird migrates to their breeding grounds flying over Shandong, Hebei,

Gansu provinces. There were several breeding records in Xinlong of Hebei Province, Zunyi and Tongren of Guizhou Province, middle part of Fujian Province, and Qishan of Shaanxi Province (Cheng 1979; Yang et al. 1985; Lei 1993).

Methods

The fieldwork was conducted from late May to early July of 2003–2009. Line transects were used to traverse the potential foraging habitats (intermountain stream and wide waters) and potential nesting sites (natural tree cavities).

Results

Records of breeding population

Since 2003, the breeding population of Mandarin Duck was first recorded in Pingshan, Hebei Province, China. Recently the population has been gradually increasing in Jiaotanzhuang-Hehekou region (N 38°34.173'–40.621', E 113°43.818'–49.351', elevation 605–968 m). They are always discovered to present around late March and to leave at mid July (Table 1).

Nest parameters and hatching success

On 26th April of 2009, two nests of Mandarin Duck (the distance between them is around 100 m) were found in cavities of willow tree close to shallow water (Fig. 1, Fig. 2). The nests are quite close to human disturbances (only 5 m to road, about 70 m to farmland, and 200 m to village). The parameters of the nests are shown in Table 2.

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On 16th May, the female of Mandarin Duck was incubating in nest No.1, whereas the eggs in nest No. 2 were taken away (several nest-materials such as down feather were left under the willow tree). On 20th May, the eggs in nest No.1 were successfully hatched (most fledglings have left, except one nestling died and one remained unruptured).

Table 1. Records of breeding population of Mandarin Duck in Pingshan, Hebei Province, China from 2003 to 2009

Year	Date	Place	population	Remarks
2003	2 nd July	Muchang, Hehekou town	1 female	
2004	6 th May	Muchang, Hehekou town	1 female and 1 male	
2005	28 th April	Muchang, Hehekou town	1 female and 1 male	
	2 nd May	Sangyuankou, Jiaotanzhuang town	2 males	Their distance is about 1.5km. We found one nest with 6 eggs.
2006	3 rd May	Muchang, Hehekou town	1 female and 1 male	
	22 nd May	Zhongtian, Jiaotanzhuang town	1 male	
2007	29 th April	Waidahe, Hehekou town	5 males	
	30 th March	Zhongtian, Jiaotanzhuang town	1 female and 1 male	
2008	2 nd April	Waidahe, Hehekou town	1 female and 1 male	Molting
	18 th June	Zhongtian, Jiaotanzhuang town	1 female and 1 male	
	20 th March	Zhongtian, Jiaotanzhuang town	1 female and 1 male	
	26 th April	Waidahe, Hehekou town	1 female and 1 male	Two nests were found. A female is incubating 14 eggs.
2009	26 th April	Sangyuankou, Jiaotanzhuang town	1 female and 1 male	
	26 th April	Zhongtian, Jiaotanzhuang town	2 females and 1 male	

Table 2 the nests parameters of breeding Mandarin Duck in Pingshan, Hebei Province, China

No.	Height (m)	Depth (cm)	Tree branches	Number of the entrances of cavity	Biggest entrances (cm×cm)	Number of eggs	remarks
1	4.0	40	3	4	12×10	14	The female is incubating.
2	2.0	44	2	3	12×9	4	Egg laying period

Discussion

Mandarin Duck was once a passing migrant species in Pingshan (Guo et al. 1990). However, since the breeding population was recorded in Jiaotanzhuang-Hehekou region in 2003, their population has been gradually increasing recently (Table 1). The

finding of new breeding Mandarin Duck in Pingshan provides a new evidence of their range expansion to south (extending southward about 400 km from Xinglong of Hebei Province). The expansion of their breeding grounds could be assumed as the following two reasons: (1) the increasing population in Northeast China leads to their range expansion to Pingshan of Hebei; (2) the deterioration of their former suitable breeding habitats (especially nesting site) in Northeast China forces some of them to move and find new suitable ones.



Fig. 1 A female Mandarin Duck is going out from the willow tree cavity.



Fig. 2 The eggs of Mandarin Duck in willow tree cavity nest.

The increasing breeding population in Pingshan indicates that there are suitable breeding habitats for Mandarin Duck in which intermountain stream and wide waters function as foraging habitats, natural willow tree cavities as nesting sites. However, their nest height only ranges from 2 m to 4 m, which is significantly lower than those populations from Northeast China (usually 10 m to 18 m, Zhao 2001). Furthermore, those nesting habitats are always close to human disturbances (such as road, village, and farmland), which is the potential risk for their increasing population. Since little information is known about the unprotected population and their unaware conditions, it is urgent to put forward an applicable protection strategy, and to strengthen the public awareness for the endangered species.

References

- Cheng Tsohsin. 1979. *Fauna Sinica Aves Vol.2 Anseriformes*. Beijing: Science press. (in Chinese)
- Guo Ling, Zhang Zhiqiang, Tang Baozhen, Liu Bingwu, Wu Yuefeng. 1990. Preliminary investigation of Aves in Pingshan, Hebei province. *Chinese Journal of Zoology*, **25**(4): 16–21. (in Chinese)
- Lei Fumin. 1993. New breeding ground of Mandarin Duck (*Aix galericulata*). *Wildlife*, **75**: 45. (in Chinese)
- Madge S, Burn H. 1987. *Wildfowl: An identification guide to the ducks, geese and swans of the world*. London: Christopher Helm.
- Wang Song. 1998. *China Red Data Book of Endangered Animals: birds*. Beijing: Science press. (in Chinese)
- Yang Jiongli, Zou Xun, Lin Qianzheng. 1985. The breeding ecology of Mandarin Duck (*Aix galericulata*) in Fanjingshan region. *Wildlife*, **26**: 15–17. (in Chinese)
- Zhao Zhengjie. 2001. *A Handbook of the Birds of China (Volume I: Non-passerines)*. Changchun: Jilin Science and Technology Press. (in Chinese)